NSERC Canadian Network for Aquatic Ecosystem Services

Theme 1, Project 1.3a

Geographic Extension of Benthic Invertebrate RCA Bioassessments: How Far Can We Go?

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Abstract

Benthic invertebrate RCA bioassessments are generally developed using reference sites within a localized area such as a watershed or ecoregion. If such reference data can be used to assess test sites that lie outside their geographic scope, it would reduce the need to collect time-consuming and costly reference site data. In this study, we examined invertebrate and environmental data to assess concordance of benthic communities and develop predictive models using data from three areas in Canada: the Attawapiskat watershed in northern Ontario, the Fraser River watershed in British Columbia, and the Yukon River watershed. RCA bioassessments were developed based on reference sites from the individual watersheds and on pooled data from the three. The effectiveness of assessments was evaluated using a common set of artificially impaired sites. The results of this study reveal that assessments using reference sites from other watersheds perform similarly to those using only local reference data, suggesting that reference sites sampled in one watershed could be "exported" for effective bioassessment in other adjacent or more distant watersheds.

Keywords: Bioassessment, Benthic invertebrates, Reference Condition Approach, predictive modelling, Canadian Aquatic Biomonitoring Network, CABIN

Geographic Location

Attawapiskat River Basin, Ontario, Canada
Yukon River Basin, Yukon Territory, Canada
Fraser River Basin, British Columbia, Canada

How does your project link to Canadian aquatic ecosystem services?

The development and application of bioassessments over large geographic regions in Canada enables us to protect and monitor Canadian aquatic ecosystem services that are important to us as a society such as clean water and fish resources.